# Shubham Ugare

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https://shubhamugare.github.io

## Education

**University of Illinois at Urbana-Champaign** [*PhD*] *2020 - 2025*
Computer Science (Adviser: Prof. Sasa Misailovic, Prof. Gagandeep Singh)

Research areas: Machine Learning, Programming Languages

**Indian Institute of Technology, Guwahati** [*BTech*] *2014 - 2018*
Computer Science and minor in Mathematics

## Publications

- **DINGO: Constrained Inference for Diffusion LLMs**
  Tarun Suresh, Debangshu Banerjee, Shubham Ugare, Sasa Misailovic, Gagandeep Singh
  Preprint. Under Review
- **ARQ: A Mixed-Precision Quantization Framework for Accurate and Certifiably Robust DNNs**
  Yuchen Yang, Shubham Ugare, Yifan Zhao, Gagandeep Singh, Sasa Misailovic.
  Preprint. Under Review
- **Byte-level Tokenizers Unavoidably Enable LLMs to Generate Ill-formed UTF-8**
  Preston Firestone, Shubham Ugare, Gagandeep Singh, Sasa Misailovic
  **COLM 2025**
- **CRANE: Reasoning with constrained LLM generation**
  Debangshu Banerjee, Tarun Suresh, Shubham Ugare, Sasa Misailovic, Gagandeep Singh
  **ICML 2025**
- **IterGen: Iterative Semantic-aware Structured LLM Generation with Backtracking**
  Shubham Ugare, Rohan Gumaste, Tarun Suresh, Gagandeep Singh, Sasa Misailovic.
  **ICLR 2025**
- **SynCode: LLM Generation with Grammar Augmentation**
  Shubham Ugare, Tarun Suresh, Hangoo Kang, Sasa Misailovic, Gagandeep Singh
  **TMLR 2025**
- **Incremental Randomized Smoothing Certification**
  Shubham Ugare, Tarun Suresh, Debangshu Banerjee, Gagandeep Singh, Sasa Misailovic
  **ICLR 2024**
- **On the Robustness of Watermarking LLM Generated Code**
  Tarun Suresh, Shubham Ugare, Gagandeep Singh, Sasa Misailovic
  **Tiny papers ICLR 2024 (Oral)**
- **Incremental Verification of Neural Networks**
  Shubham Ugare, Debangshu Banerjee, Sasa Misailovic, Gagandeep Singh
  **PLDI 2023**
- **Toward Continuous Verification of DNNs**
  Shubham Ugare, Debangshu Banerjee, Tarun Suresh, Sasa Misailovic, Gagandeep Singh
  **Workshop @ ICML 2023**

- **TeAAL: A Declarative Modeling Framework for Sparse Tensor Accelerators**
  Nandeeka Nayak, Toluwanimi Odemuyiwa, Shubham Ugare, Christopher Fletcher, Michael Pellauer, Joel Emer
  **MICRO 2023**, **Micro Top Picks 2023 Honorable Mention**
  **Workshop @ PLDI 2023**

- **A General Construction for Abstract Interpretation of Higher-Order Automatic Differentiation**
  Jacob Laurel, Rem Yang, Shubham Ugare, Robert Nagel, Gagandeep Singh, Sasa Misailovic
  **OOPSLA 2022**

- **Proof Transfer for Fast Certification of Multiple Approximate Neural Networks**
  Shubham Ugare, Gagandeep Singh, Sasa Misailovic
  **OOPSLA 2022**

- **Statheros: A Compiler for Efficient Low-Precision Probabilistic Programming**
  Jacob Laurel, Rem Yang, Atharva Sehgal, Shubham Ugare, Sasa Misailovic
  **DAC 2021**

- **Secure Medical Image Analysis with CrypTFlow***
  Javier Alvarez-Valle, Pratik Bhatu, Nishanth Chandran, Divya Gupta, Aditya Nori, Aseem Rastogi, Mayank Rathee, Rahul Sharma, Shubham Ugare
  **Workshop @ NeurIPS 2020**

- **Approximate Query Processing over Static Sets and Sliding Windows***
  Ran Ben Basat, Seungbum Jo, Srinivasa Rao Satti, Shubham Ugare
  **ISAAC 2018 and TCS 2021**

  (* marked author names are alphabetically sorted)

## Work Experience

- **Bloomberg LP** [*Research Intern*] *May 24 - present*
  - *large language models* (LLMs) for generating program specifications

- **Uber** [*Research Software Engineering Intern*] *Summer 22', Summer 23'*
  - Using *LLMs* for automated code fixes using code reviews
  - *Static analysis* tool to detect potential nil panics in Go

- **Microsoft Research** [*Research Software Engineer*] *Oct 2019 - Jul 2020*
  - Worked on SeeDot *compiler* that performs fixed-point compilation of ML models

- **Uber** [*Software Engineer*] *July 2018 - Oct 2019*
  - Worked on NullAway *static program analysis* tool to statically find JAVA NPEs
  - Worked on Uber Lite, Uber bus applications

- **Max Plank Institute of Software Systems, Germany** [*Research fellow*] *Summer 18'*
  - *machine learning* techniques for invariant synthesis

- **Seoul National University** [*Research Intern*] *Summer 17'*
  - Succinct data structures to solve query processing problems

## Teaching

Teaching Assistant, CS421 Programming Languages & Compilers, UIUC Fall 2020

Teaching Assistant, CS521 Advanced Topics in Programming Systems, UIUC Spring 2024

## Service

**Organizer**: NNV workshop @ ICML 2023, UIUC compiler seminar

**Reviewer**: TMLR, JMLR, CAV 2024 (artifact), ICLR 2025, ICML 2024, 2025, NeurIPS 2025, COLM 2025